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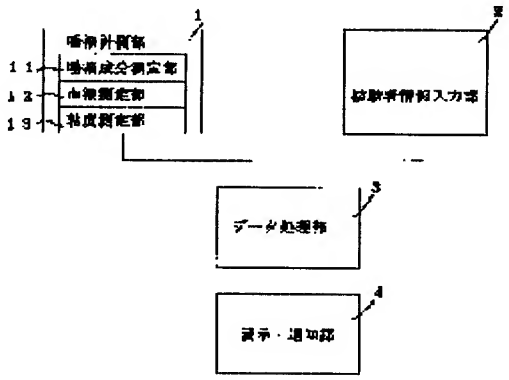
(54) METHOD FOR CONVERTING SALIVA COMPONENT INTO BLOOD COMPONENT, DEVICE THEREFOR AN DIAGNOSTIC EQUIPMENT

(57)Abstract:
PROBLEM TO BE SOLVED: To enable diagnosis from a saliva component by conducting conversion processing, based on the subject information for the analysis result of a saliva component of a subjected to calculate the analysis result of the blood component.
SOLUTION: When a saliva sampled from a subject is supplied to a saliva measuring part 1 in a saliva component measuring part 11, an electrical signal corresponding to the concentration of a desired component in the saliva is generated and output. In a blood measuring part 12, the existence of occult of blood is detected to output the occult blood information. Furthermore, in a viscosity measuring part 13, the viscosity of saliva is detected to output an electrical signal. In addition, in a subject information input part 2, necessary subject information is input. According to the output data from the saliva measuring part 1 and subject information from the subject information input part 2, the data is processed by the data processing part 3, whereby the result of conversion from the saliva component to the blood component is obtained, and the result is supplied to a display part 4 for display.



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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] The conversion approach from the saliva component characterized by computing a constituent-of-blood analysis result by analyzing the component of the saliva extracted from the test subject, and performing conversion processing based on test subject information to the obtained analysis result to a constituent of blood.
[Claim 2] The conversion approach from the saliva component according to claim 1 which performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva to a constituent of blood.
[Claim 3] Said test subject information is the conversion approach from the saliva component according to claim 1 or 2 which is at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva to a constituent of blood.
[Claim 4] The inverter from the saliva component characterized by including a saliva component analysis means (11) to analyze the component of the saliva extracted from the test subject, and a conversion means (3) to compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means (11) to a constituent of blood.
[Claim 5] Said saliva component analysis means (11) is an inverter from the saliva component according to claim 4 which is what performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva to a constituent of blood.
[Claim 6] Said conversion means (3) is an inverter from the saliva component according to claim 4 or 5 which is what adopts at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva as said test subject information to a constituent of blood.
[Claim 7] A saliva component analysis means to analyze the component of the saliva extracted from the test subject (11), A conversion means to compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means (11) (3), Diagnostic equipment characterized by including a comparison means (5) to output the diagnostic signal which shows a test subject's health condition by comparing the computed constituent-of-blood analysis result with a predetermined threshold.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the diagnostic equipment which comes to incorporate the approach of changing components, such as sugar contained in saliva, into the component to which it corresponds in blood, its equipment, and this equipment, if it says further a detail about the conversion approach, its equipment, and diagnostic equipment from a saliva component to a constituent of blood.
[0002]
[Description of the Prior Art] Various approaches are proposed in order to measure a constituent of blood from the former.
[0003] A test subject's blood is extracted and, specifically, the method of obtaining a constituent-of-blood analysis result is proposed by supplying the extracted blood to an electrode type sensor etc., and performing predetermined processing to the output signal from an electrode type sensor.
[0004] Moreover, the general-purpose analyzer which measures the component of a test subject's saliva is also proposed.
[0005]
[Problem(s) to be Solved by the Invention] Since it is indispensable to extract blood when adopting the measuring method of the above-mentioned constituent of blood, there is un-arranging [that displeasure (mental anguish accompanying blood collecting, such as fear of a bodily pain and virus infection) will be given to a test subject].
[0006] Since the measuring method of the above-mentioned saliva component only applied saliva to the general-purpose analyzer, it is remarkably difficult or impossible for a clinical medical practitioner etc. to obtain a measurement result employable as criteria of decision. Furthermore, it explains to a detail. In order to judge whether a test subject is healthy, generally the measurement result of a constituent of blood is used. On the other hand, the measurement result of a saliva component is not used for the above-mentioned judgment. Although examination of whether correlation is between a saliva component and a constituent of blood is performed here, while there is no correlation or there is, even if it is a test subject with correlation, if a day differs from time of day, since correlation will worsen, it cannot be said by the test subject that correlation is between a saliva component and a constituent of blood universally. Consequently, it was thought that it was impossible to convert a saliva component into a constituent of blood, and it was impossible to diagnose a test subject based on the measurement result of a saliva component.
[0007] Moreover, since a general-purpose analyzer outputs the analysis result based on the saturation value (end point) of a measurement signal, a duration will become long.
[0008]
[Objects of the Invention] This invention is made in view of the above-mentioned trouble, and while offering the approach of converting a saliva component into a constituent of blood universally, and its equipment, it aims at offering the diagnostic equipment which can diagnose a test subject from a saliva component.

[0009]
[Means for Solving the Problem] The conversion approach from the saliva component of claim 1 to a constituent of blood is the approach of computing a constituent-of-blood analysis result by analyzing the component of the saliva extracted from the test subject, and performing conversion processing based on test subject information to the obtained analysis result.
[0010] The conversion approach from the saliva component of claim 2 to a constituent of blood is an approach of performing analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva.
[0011] The conversion approach from the saliva component of claim 3 to a constituent of blood is the approach of adopting at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva as said test subject information.
[0012] The inverter from the saliva component of claim 4 to a constituent of blood includes a saliva component analysis means to analyze the component of the saliva extracted from the test subject, and a conversion means to compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means.
[0013] What performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva as said saliva component analysis means is used for the inverter from the saliva component of claim 5 to a constituent of blood.
[0014] What adopts at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva as said test subject information as said conversion means is used for the inverter from the saliva component of claim 6 to a constituent of blood.
[0015] The diagnostic equipment of claim 7 includes a comparison means output the diagnostic signal which shows a test subject's health condition, by comparing a saliva component-analysis means analyze the component of the saliva extracted from the test subject, and a conversion means compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component-analysis means with the computed constituent-of-blood analysis result and a predetermined threshold.
[0016]
[Function] If it is the conversion approach from the saliva component of claim 1 to a constituent of blood, the component of the saliva extracted from the test subject will be analyzed. In converting a saliva component into a constituent of blood, since a constituent-of-blood analysis result is computed by performing conversion processing based on test subject information to the obtained analysis result, by performing conversion processing based on test subject information A saliva component can be universally converted into a constituent of blood, and an exact constituent-of-blood analysis result can be obtained.
[0017] If it is the conversion approach from the saliva component of claim 2 to a constituent of blood, since analysis of the component of saliva will be performed by computing the rate of a temporal response of the measurement signal of the component of saliva, in addition to an operation of claim 1, time amount required for analysis of a saliva component can be shortened.
[0018] If it is the conversion approach from the saliva component of claim 3 to a constituent of blood, since at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva will be adopted as said test subject information, the same operation as claim 1 can be attained by adopting at least one information.
[0019] If it is an inverter from the saliva component of claim 4 to a constituent of blood, a constituent-of-blood analysis result can be computed by the ability of a conversion means for a saliva component analysis means to analyze the component of the saliva extracted from the test subject, and perform conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means.

[0020] Therefore, a saliva component can be universally converted into a constituent of blood, and an exact constituent-of-blood analysis result can be obtained.
[0021] If it is an inverter from the saliva component of claim 5 to a constituent of blood, since what performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva as said saliva component analysis means will be adopted, in addition to an operation of claim 4, time amount required for analysis of a saliva component can be shortened.
[0022] If it is an inverter from the saliva component of claim 6 to a constituent of blood, as said conversion means A test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, Since what adopts at least one information chosen from a salivation rate and the viscosity of saliva as said test subject information is adopted, the same operation as claim 4 can be attained by adopting at least one information.
[0023] The diagnostic signal which shows a test subject's health condition can output by comparing with a predetermined threshold the constituent-of-blood analysis result which analyzed the component of the saliva extracted from the test subject with the saliva component-analysis means, computed a constituent-of-blood analysis result by having performed conversion processing based on test subject information with the conversion means to the analysis result obtained by the saliva component-analysis means, and was computed by the comparison means, if it is the diagnostic equipment of claim 7.
[0024] Therefore, a test subject's health condition can be diagnosed by non-invasion.
[0025]
[Embodiment of the Invention] Hereafter, with reference to an accompanying drawing, the mode of operation of the conversion approach from the saliva component of this invention to a constituent of blood, its equipment, and diagnostic equipment is explained to a detail.
[0026] Drawing 1 is the block diagram showing one embodiment of the inverter of this invention.
[0027] This inverter has the saliva measurement section 1, the test subject information input section 2, the data-processing section 3 that performs predetermined data processing based on the test subject information from the output data from the saliva measurement section 1, and the test subject information input section 2, and the display 4 which displays the data-processing result from the data-processing section 3. This display 4 performs the display in a figure, two or more steps of lamp display, or the notice of voice.
[0028] Said saliva measurement section 1 contains the saliva component test section 11, the blood test section 12, and the viscosity test section 13. Here, the saliva component test section 11 outputs the electrical signal according to the concentration of the component in saliva by carrying out point arrival of the saliva extracted from the test subject. For example, base material 11a into which the color reagent was infiltrated as shown in drawing 2 and light source 11b which irradiates light toward base material 11a, As you may be the so-called colorimetry type sensor which has light sensing portion 11c which receives the reflected light from base material 11a, and outputs the electrical signal according to the light-receiving quantity of light etc. and it is shown in drawing 3 While forming anode plate 11e which consists of platinum etc., and 11f of cathode on 11d of substrates You may be the so-called electrode type sensor which prepares 11g of enzyme film so that anode plate 11e and 11f of cathode may be covered, and comes to prepare 11h of drawer wiring further connected with anode plate 11e and 11f of cathode electrically. The blood test section 12 consists of a colorimetry type sensor which adopts hemoglobin detection reagents, such as tetramethyl bench gin, as a color reagent, and can acquire and output the occult blood information in saliva. This occult blood information is supplied to a display 4 as it is through the data-processing section 3, and enables it to indicate that there is occult blood. The viscosity test section 13 measures the viscosity of saliva, and stirs saliva by the stirring child, for example, the equipment which outputs the electrical signal which detects viscosity and corresponds from the load effect is used for it.
[0029] Said test subject information input sections 2 are input units, such as a keyboard, and can input at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, etc.
[0030] Said data-processing section 3 performs predetermined data processing by considering

the electrical signal from the saliva component test section 11, the electrical signal from the viscosity test section 13, and test subject information from the test subject information input section 2 as an input, and outputs the processing result which can be approximated to a constituent-of-blood analysis result. Here, in the data-processing section 3, with a predetermined time interval, the electrical signal from the saliva component test section 11 is sampled, the difference of the electrical signals which adjoin each other in time is computed, and predetermined data processing is performed using the maximum of the computed difference. And predetermined data processing is performed as follows, for example.

[0031] x, then presumed saliva component value f (x) is the maximum of difference f(x) =xx(saliva extraction location multiplier) x(viscosity coefficient) x (secretion velocity coefficient)
It is computable by performing ******.

[0032] Here, when mixed saliva is extracted, only the saliva from the parotid (serous gland) is extracted for alpha and only the saliva from an submaxillary gland (mixed gland) or a sublingual gland (mixed gland) is extracted for beta, as for a saliva extraction location multiplier, gamma is chosen, respectively. These multiplier values are determined for example, as an experiment target. A viscosity coefficient is obtained by doing the division of the measured viscosity with the standard viscosity which was able to be defined beforehand. However, since diffusion of a measuring object component will become good and an electrical signal will come out more highly if viscosity is low while diffusion of a measuring object component (for example, grape sugar) will be checked and an electrical signal will come out lowness, if viscosity is high, the correction factor at the time of standard viscosity is set to 1, a correction factor is set to 1 or more and less than 2 at the time of hyperviscosity, it is larger than 0.5 at the time of hypoviscosity, and it sets a correction factor or less to one. The secretion rate of saliva is obtained by doing the division of the output of saliva by the extraction time amount of saliva. And the value which amended the secretion rate with the velocity coefficient smaller more greatly than 1 than 1.2 since the value which amended the secretion rate with the velocity coefficient smaller more greatly than 0.8 than 1 since the saliva component was thin when a secretion velocity coefficient had a quick secretion rate was adopted, and the saliva component was deep when a secretion rate was slow is adopted.

[0033] And a, then conversion constituent-of-blood value g (a) are computed presumed saliva component value f (x) g(a) =ax(calibration factor) x(extraction time factor) x(BMI multiplier) x(sex multiplier) x (age multiplier)
It is computable by performing ******.

[0034] Here, a calibration factor is a multiplier for performing proofreading with a saliva component and a constituent of blood, and is set up on the basis of the constituent-of-blood value at the time of hungry. In addition, this proofreading is performed at 1 time of a rate at two weeks. Since extent from which a constituent-of-blood value changes in connection with elapsed time after a meal is shown, and an after-a-meal rise is carried out in the case of the blood sugar level, for example, it falls gradually over about 2 hours after that, an extraction time factor is set up as a function showing such change. A BMI multiplier is set up as a value which did the division of the BMI (Body Mass Index) by Criterion BMI. In addition, BMI is the value which did the division of the weight (kg) by the square of height (m). A sex multiplier is a correction factor about the alarm about the component from which criteria differ by sex, for example, a cholesterol count etc. is set up that a female person should amend the difference of such a permissible level value since the permissible level value is somewhat high. As for an age multiplier, youth **** has many amounts of salivation, and an advanced age layer is set up in consideration of there being few amounts of salivation that the difference of the amount of salivation should be amended. When a test subject is less than 20 years old, a test subject is from 20 years old to 60 years old about an age multiplier less than one, and a test subject exceeds 60 years old for an age multiplier to 1, it is larger than 1 and, specifically, an age multiplier is set up, respectively.

[0035] The operation of the inverter of the above-mentioned configuration is as follows.

[0036] If the saliva extracted from the test subject is supplied to the saliva measurement section 1, the electrical signal corresponding to the concentration of the component of the

request included in saliva in the saliva component test section 11 will be generated and outputted. Moreover, the existence of occult blood is detected in the blood test section 12, and occult blood information is outputted. Furthermore, in the viscosity test section 13, the viscosity of saliva is detected, and the electrical signal corresponding to viscosity is generated and outputted.

[0037] Moreover, required test subject information is inputted in the test subject information input section 2.

[0038] And if the input of the test subject information in the test subject information input section 2 is performed while the above-mentioned measurement in the saliva measurement section 1 is performed, by performing the above-mentioned data processing in the data-processing section 3 based on the test subject information from the output data from the saliva measurement section 1, and the test subject information input section 2, the conversion result from a saliva component to a constituent of blood can be obtained, and this conversion result can be supplied and displayed on a display 4.

[0039] Subsequently, an example is explained.

[0040] The difference of the theoretical grape-sugar concentration and the actual measurement which are obtained by dilution has a thing beyond the concentration change by dilution, and a good result is obtained by amending this with the function by viscosity. The result of having surveyed using two samples was specifically as being shown in Table 1, Table 2, and drawing 4 , and the viscosity correction factor computed from each was as having been plotted by drawing 5 . And when computing the multiplier of viscosity correction factor $y=ax2+bx+c$ expressed in approximation as a function of viscosity x from these viscosity correction factors, respectively, it was set to a= 0.0329, b=-0.2765, and c= 1.5597, and the correlation coefficient R was set to R2=0.7859. That is, the error of the grape-sugar concentration after amendment and a theoretical value was able to be made less than **8%.

[0041]

[Table 1]

唾液粘度 (CP)	理論ブドウ糖濃度A (mg/dl)	実側値B (mg/dl)	出力比B／A (粘度補正係数)
5.0	2.34	2.34	1
2.5	1.17	1.32	1.128205128
1.0	0.47	0.67	1.425531915

[0042]

[Table 2]

唾液粘度 (CP)	理論ブドウ糖濃度A (mg/dl)	実側値B (mg/dl)	出力比B／A (粘度補正係数)
5.0	8.93	8.93	1
2.5	4.47	4.56	1.020134228
1.0	1.79	2.16	1.206703911

Although it is performing amendment only based on saliva viscosity, the above-mentioned example can be amended in consideration of other multipliers, as shown in the above-mentioned formula, and also can be amended in consideration of other at least one multiplier, and can make an error with a theoretical value small.

[0043] In addition, in the above-mentioned embodiment, since the maximum of the amount of temporal responses of an electrical signal is extracted in the data-processing section 3 and it is made to perform data processing based on this maximum, a duration can be shortened. However,

the maximum of an electrical signal is extracted and it may be made to perform data processing instead of extracting the maximum of the amount of temporal responses of an electrical signal, when it can be permitted that a duration becomes long based on this maximum.
[0044] Drawing 6 is the block diagram showing one embodiment of diagnostic equipment.
[0045] This diagnostic equipment has the saliva measurement section 1, the test subject information input section 2, the data-processing section 3 that performs predetermined data processing based on the test subject information from the output data from the saliva measurement section 1, and the test subject information input section 2, the comparator 5 which obtains a diagnostic result for the data-processing result from the data-processing section 3 as compared with a predetermined threshold, and the display 4 which displays a diagnostic result. In addition, you may make it it not only to display a diagnostic result, but display a data-processing result as a display 4.
[0046] Said saliva measurement section 1, the test subject information input section 2, and the data-processing section 3 have the same configuration as the saliva measurement section 1 of said inverter, the test subject information input section 2, and the data-processing section 3.
[0047] The threshold value which shows that the constituent-of-blood value changed from the saliva component value by data processing is a healthy person's constituent-of-blood value is beforehand set up as a predetermined threshold, and said comparator 5 can obtain a diagnostic result for the data-processing result from the data-processing section 3 as compared with this predetermined threshold.
[0048] When the diagnostic equipment of the above-mentioned configuration is adopted, based on the changed constituent-of-blood value which it is as a result of data processing, it can judge by the comparator 5 whether it is health, and can display by the display 4 by making a decision result into a diagnostic result.
[0049] Therefore, a test subject's health condition can be diagnosed by non-invasion.
[0050]
[Effect of the Invention] In converting a saliva component into a constituent of blood, by performing conversion processing based on test subject information, invention of claim 1 can convert a saliva component into a constituent of blood universally, and does so the characteristic effectiveness that an exact constituent-of-blood analysis result can be obtained.
[0051] In addition to the effectiveness of claim 1, invention of claim 2 does so the characteristic effectiveness that time amount required for analysis of a saliva component can be shortened.
[0052] Invention of claim 3 does so the same effectiveness as claim 1 by adopting at least one information.
[0053] Invention of claim 4 can convert a saliva component into a constituent of blood universally, and does so the characteristic effectiveness that an exact constituent-of-blood analysis result can be obtained.
[0054] In addition to the effectiveness of claim 4, invention of claim 5 does so the characteristic effectiveness that time amount required for analysis of a saliva component can be shortened.
[0055] Invention of claim 6 does so the same effectiveness as claim 4 by adopting at least one information.
[0056] Invention of claim 7 does so the characteristic effectiveness that a test subject's health condition can be diagnosed by non-invasion.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since it is indispensable to extract blood when adopting the measuring method of the above-mentioned constituent of blood, there is un-arranging [that displeasure (mental anguish accompanying blood collecting, such as fear of a bodily pain and virus infection) will be given to a test subject].
[0006] Since the measuring method of the above-mentioned saliva component only applied saliva to the general-purpose analyzer, it is remarkably difficult or impossible for a clinical medical practitioner etc. to obtain a measurement result employable as criteria of decision. Furthermore, it explains to a detail. In order to judge whether a test subject is healthy, generally the measurement result of a constituent of blood is used. On the other hand, the measurement result of a saliva component is not used for the above-mentioned judgment. Although examination of whether correlation is between a saliva component and a constituent of blood is performed here, while there is no correlation or there is, even if it is a test subject with correlation, if a day differs from time of day, since correlation will worsen, it cannot be said by the test subject that correlation is between a saliva component and a constituent of blood universally. Consequently, it was thought that it was impossible to convert a saliva component into a constituent of blood, and it was impossible to diagnose a test subject based on the measurement result of a saliva component.
[0007] Moreover, since a general-purpose analyzer outputs the analysis result based on the saturation value (end point) of a measurement signal, a duration will become long.
[0008]
[Objects of the Invention] This invention is made in view of the above-mentioned trouble, and while offering the approach of converting a saliva component into a constituent of blood universally, and its equipment, it aims at offering the diagnostic equipment which can diagnose a test subject from a saliva component.

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MEANS

[Means for Solving the Problem] The conversion approach from the saliva component of claim 1 to a constituent of blood is the approach of computing a constituent-of-blood analysis result by analyzing the component of the saliva extracted from the test subject, and performing conversion processing based on test subject information to the obtained analysis result.
[0010] The conversion approach from the saliva component of claim 2 to a constituent of blood is an approach of performing analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva.
[0011] The conversion approach from the saliva component of claim 3 to a constituent of blood is the approach of adopting at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva as said test subject information.
[0012] The inverter from the saliva component of claim 4 to a constituent of blood includes a saliva component analysis means to analyze the component of the saliva extracted from the test subject, and a conversion means to compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means.
[0013] What performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva as said saliva component analysis means is used for the inverter from the saliva component of claim 5 to a constituent of blood.
[0014] What adopts at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva as said test subject information as said conversion means is used for the inverter from the saliva component of claim 6 to a constituent of blood.
[0015] The diagnostic equipment of claim 7 includes a comparison means output the diagnostic signal which shows a test subject's health condition, by comparing a saliva component-analysis means analyze the component of the saliva extracted from the test subject, and a conversion means compute a constituent-of-blood analysis result by performing conversion processing based on test subject information to the analysis result obtained by the saliva component-analysis means with the computed constituent-of-blood analysis result and a predetermined threshold.

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OPERATION

[Function] If it is the conversion approach from the saliva component of claim 1 to a constituent of blood, the component of the saliva extracted from the test subject will be analyzed. In converting a saliva component into a constituent of blood, since a constituent-of-blood analysis result is computed by performing conversion processing based on test subject information to the obtained analysis result, by performing conversion processing based on test subject information A saliva component can be universally converted into a constituent of blood, and an exact constituent-of-blood analysis result can be obtained.
[0017] If it is the conversion approach from the saliva component of claim 2 to a constituent of blood, since analysis of the component of saliva will be performed by computing the rate of a temporal response of the measurement signal of the component of saliva, in addition to an operation of claim 1, time amount required for analysis of a saliva component can be shortened.
[0018] If it is the conversion approach from the saliva component of claim 3 to a constituent of blood, since at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, and the viscosity of saliva will be adopted as said test subject information, the same operation as claim 1 can be attained by adopting at least one information.
[0019] If it is an inverter from the saliva component of claim 4 to a constituent of blood, a constituent-of-blood analysis result can be computed by the ability of a conversion means for a saliva component analysis means to analyze the component of the saliva extracted from the test subject, and perform conversion processing based on test subject information to the analysis result obtained by the saliva component analysis means.
[0020] Therefore, a saliva component can be universally converted into a constituent of blood, and an exact constituent-of-blood analysis result can be obtained.
[0021] If it is an inverter from the saliva component of claim 5 to a constituent of blood, since what performs analysis of the component of saliva by computing the rate of a temporal response of the measurement signal of the component of saliva as said saliva component analysis means will be adopted, in addition to an operation of claim 4, time amount required for analysis of a saliva component can be shortened.
[0022] If it is an inverter from the saliva component of claim 6 to a constituent of blood, as said conversion means A test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, Since what adopts at least one information chosen from a salivation rate and the viscosity of saliva as said test subject information is adopted, the same operation as claim 4 can be attained by adopting at least one information.
[0023] The diagnostic signal which shows a test subject's health condition can output by comparing with a predetermined threshold the constituent-of-blood analysis result which analyzed the component of the saliva extracted from the test subject with the saliva component-analysis means, computed a constituent-of-blood analysis result by having performed conversion processing based on test subject information with the conversion means to the analysis result obtained by the saliva component-analysis means, and was computed by the comparison means, if it is the diagnostic equipment of claim 7.
[0024] Therefore, a test subject's health condition can be diagnosed by non-invasion.

[0025]
[Embodiment of the Invention] Hereafter, with reference to an accompanying drawing, the mode of operation of the conversion approach from the saliva component of this invention to a constituent of blood, its equipment, and diagnostic equipment is explained to a detail.
[0026] Drawing 1 is the block diagram showing one embodiment of the inverter of this invention.
[0027] This inverter has the saliva measurement section 1, the test subject information input section 2, the data-processing section 3 that performs predetermined data processing based on the test subject information from the output data from the saliva measurement section 1, and the test subject information input section 2, and the display 4 which displays the data-processing result from the data-processing section 3. This display 4 performs the display in a figure, two or more steps of lamp display, or the notice of voice.
[0028] Said saliva measurement section 1 contains the saliva component test section 11, the blood test section 12, and the viscosity test section 13. Here, the saliva component test section 11 outputs the electrical signal according to the concentration of the component in saliva by carrying out point arrival of the saliva extracted from the test subject. For example, base material 11a into which the color reagent was infiltrated as shown in drawing 2 and light source 11b which irradiates light toward base material 11a, As you may be the so-called colorimetry type sensor which has light sensing portion 11c which receives the reflected light from base material 11a, and outputs the electrical signal according to the light-receiving quantity of light etc. and it is shown in drawing 3 While forming anode plate 11e which consists of platinum etc., and 11f of cathode on 11d of substrates You may be the so-called electrode type sensor which prepares 11g of enzyme film so that anode plate 11e and 11f of cathode may be covered, and comes to prepare 11h of drawer wiring further connected with anode plate 11e and 11f of cathode electrically. The blood test section 12 consists of a colorimetry type sensor which adopts hemoglobin detection reagents, such as tetramethyl bench gin, as a color reagent, and can acquire and output the occult blood information in saliva. This occult blood information is supplied to a display 4 as it is through the data-processing section 3, and enables it to indicate that there is occult blood. The viscosity test section 13 measures the viscosity of saliva, and stirs saliva by the stirring child, for example, the equipment which outputs the electrical signal which detects viscosity and corresponds from the load effect is used for it.
[0029] Said test subject information input sections 2 are input units, such as a keyboard, and can input at least one information chosen from a test subject's age, sex, height, weight, a saliva extraction part, the elapsed time from a meal to saliva extraction, a salivation rate, etc.
[0030] Said data-processing section 3 performs predetermined data processing by considering the electrical signal from the saliva component test section 11, the electrical signal from the viscosity test section 13, and test subject information from the test subject information input section 2 as an input, and outputs the processing result which can be approximated to a constituent-of-blood analysis result. Here, in the data-processing section 3, with a predetermined time interval, the electrical signal from the saliva component test section 11 is sampled, the difference of the electrical signals which adjoin each other in time is computed, and predetermined data processing is performed using the maximum of the computed difference. And predetermined data processing is performed as follows, for example.
[0031] x, then presumed saliva component value f (x) is the maximum of difference f(x) =xx(saliva extraction location multiplier) x(viscosity coefficient) x (secretion velocity coefficient)
It is computable by performing ******.
[0032] Here, when mixed saliva is extracted, only the saliva from the parotid (serous gland) is extracted for alpha and only the saliva from an submaxillary gland (mixed gland) or a sublingual gland (mixed gland) is extracted for beta, as for a saliva extraction location multiplier, gamma is chosen, respectively. These multiplier values are determined for example, as an experiment target.

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing one embodiment of the inverter of this invention.
[Drawing 2] It is the schematic diagram showing an example of the configuration of a saliva component test section.
[Drawing 3] It is the schematic diagram showing other examples of the configuration of a saliva component test section.
[Drawing 4] It is drawing showing the relation of the grape-sugar concentration and saliva viscosity corresponding to Table 1 and 2.
[Drawing 5] It is drawing showing the actual measurement of a viscosity correction factor, and the approximate expression of a viscosity correction factor.
[Drawing 6] It is the block diagram showing one embodiment of the diagnostic equipment of this invention.
[Description of Notations]
3 Data-Processing Section 5 Comparator
11 Saliva Component Test Section

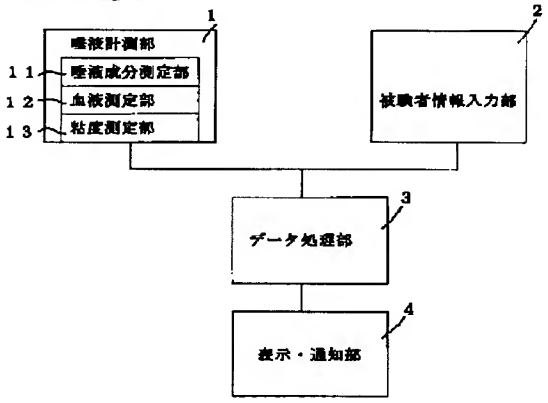
[Translation done.]

* NOTICES *

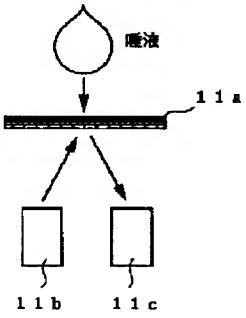
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

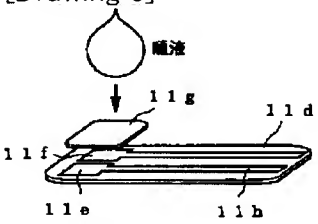
[Drawing 1]



[Drawing 2]

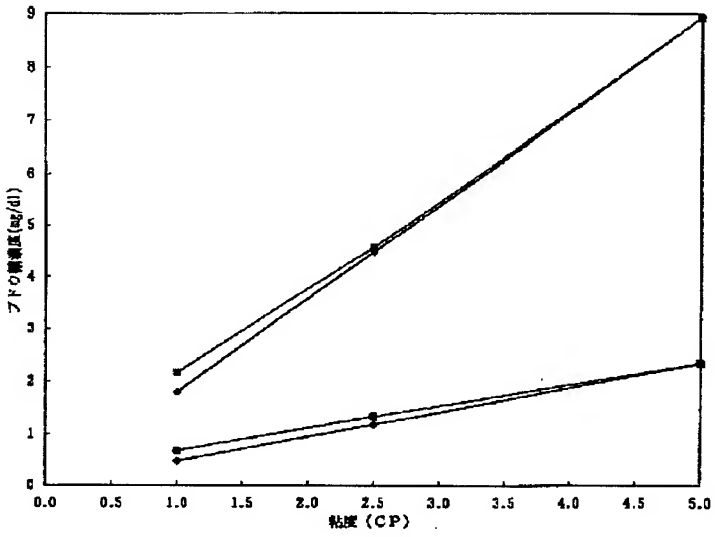


[Drawing 3]

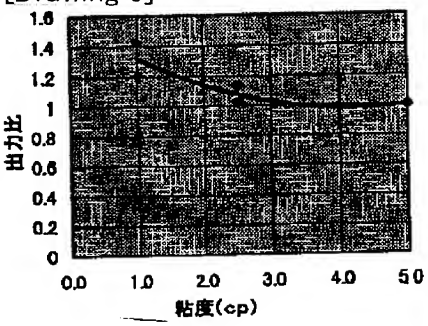


[Drawing 4]

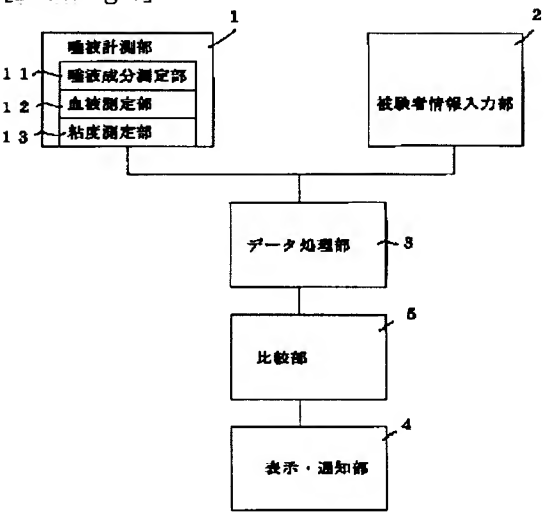
Sheet1 グラフ 1



[Drawing 5]



[Drawing 6]



[Translation done.]